

# PATENT SPECIFICATION

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## (54) EMULSIFIERS

(71) We, JEYES U.K. LIMITED, of Brunel Way, Thetford, Norfolk, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with improvements in and relating to emulsifiers and to compositions, particularly disinfectant compositions, emulsified therewith.

The use of castor oil soaps as emulsifiers, for example for disinfectant compositions, is well known and there has also been used as an emulsifier, a soap derived from a mixture of tall oil and castor oil. It has now been found, in accordance with the present invention, that the emulsification power of a mixed castor oil/tall oil soap emulsifier can be generally improved by replacing a part of the castor oil/tall oil mixture with a mixed fatty acid component as described more particularly herein after.

According to the invention, therefore, there is provided an emulsifier comprising a mixture of soaps of (a) castor oil; (b) tall oil; and (c) a mixed fatty acid component comprising a mixture of (i) oleic, linoleic and linolenic acids and (ii) lauric, palmitic and stearic acids.

The mixed fatty acid component will generally comprise a major proportion of component (i) and most suitably comprises from 60 to 80% of component (i) and from 20 to 40% of component (ii). Alternatively

The castor oil component (a) used in making the emulsifiers of the invention may be castor oil or a corresponding amount of castor oil fatty acids. The tall oil component (b) may be any commercially available tall oil and these may be defined as comprising a mixture of oleic and linoleic acids in a weight ratio of from 5:95 to 95:5 together with up to 15% by weight of other fatty acids and up to 50% by weight of rosin acids. The tall oil for use in the composition of the invention is suitably one containing about 30% by weight of rosin acids.

The weight ratio of component (a) to component (b) in the emulsifiers of the invention may suitably be within the range 75:25—25:75 preferably 60:40—40:60 and most preferably about 50:50. The mixed fatty acid component (c) is suitably present in an amount of up to 100%, preferably from 20 to 80% of the combined weight of the component (a) and (b). Thus a suitable emulsifier in accordance with the invention is the soap of the following mixture:—

|  |                        |    |
|--|------------------------|----|
| Castor Oil                             | 2 parts by weight      | 50 |
| Tall Oil containing<br>30% rosin acids | 2 parts by weight      | 55 |
| Mixed Fatty<br>Acids                   | 1 to 3 parts by weight | 60 |

It has also been found, in accordance with a further embodiment of the invention, that a proportion of the mixed fatty acid com

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By a direction given under Section 17 (1) of the Patents Act 1949 this application proceeded in the name of JEYES GROUP LIMITED, a British Company, of Brunel Way, Thetford, Norfolk.

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THE PATENT OFFICE

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The use of castor oil soaps as emulsifiers, for example for disinfectant compositions, is well known and there has also been used as an emulsifier, a soap derived from a mixture of tall oil and castor oil. It has now been found, in accordance with the present invention, that the emulsification power of a mixed castor oil/tall oil soap emulsifier can be generally improved by replacing a part of the castor oil/tall oil mixture with a mixed fatty acid component as described more particularly herein after.

According to the invention, therefore, there is provided an emulsifier comprising a mixture of soaps of (a) castor oil; (b) tall oil; and (c) a mixed fatty acid component comprising a mixture of (i) oleic, linoleic and linolenic acids and (ii) lauric, palmitic and stearic acids.

The mixed fatty acid component will generally comprise a major proportion of component (i) and most suitably comprises from 60 to 80% of component (i) and from 20 to 40% of component (ii). Alternatively, or in addition, the mixed fatty acid component (c) may be defined with regard to its chemical and physical properties and should suitably have the following properties:—

|    |              |         |
|----|--------------|---------|
| 40 | Acid Value   | 190—210 |
|    | Iodine Value | 90—125  |
|    | Titre        | 21—26°C |

Suitable mixed fatty acids for use in components (c) are commercially available as "Distilled Mixed Fatty Acids '176'" and are sold by Victor Wolf Limited.

The castor oil component (a) used in making the emulsifiers of the invention may be castor oil or a corresponding amount of castor oil fatty acids. The tall oil component (b) may be any commercially available tall oil and these may be defined as comprising a mixture of oleic and linoleic acids in a weight ratio of from 5:95 to 95:5 together with up to 15% by weight of other fatty acids and up to 50% by weight of rosin acids. The tall oil for use in the composition of the invention is suitably one containing about 30% by weight of rosin acids.

The weight ratio of component (a) to component (b) in the emulsifiers of the invention may suitably be within the range 75:25—25:75 preferably 60:40—40:60 and most preferably about 50:50. The mixed fatty acid component (c) is suitably present in an amount of up to 100%, preferably from 20 to 80% of the combined weight of the component (a) and (b). Thus a suitable emulsifier in accordance with the invention is the soap of the following mixture:—

|  |                        |
|--|------------------------|
| Castor Oil                             | 2 parts by weight      |
| Tall Oil containing<br>30% rosin acids | 2 parts by weight      |
| Mixed Fatty<br>Acids                   | 1 to 3 parts by weight |

It has also been found, in accordance with a further embodiment of the invention, that a proportion of the mixed fatty acid component may be replaced by palm kernel oil fatty acids. Thus a further emulsifier in accordance with the invention comprises a mixture of soaps of (a) castor oil; (b) tall oil; (c) mixed fatty acids as defined above; and (d) palm kernel oil fatty acids.

The palm kernel oil fatty acids component (d), is suitably a distilled material and preferably has the following physical and chemical characteristics:—

|              |         |
|--------------|---------|
| Acid Value   | 250—266 |
| Iodine Value | 14—20   |
| Titre        | 23—27°C |

|    |   |  |    |
|----|---|--|----|
| 5  | Component (d) is suitably present in the composition in an amount of up to 75% weight of the combined weight of components (c) and (d). Thus a preferred form of composition in accordance with the invention comprises the mixed soaps of:—  | less of the emulsifier is required than with known emulsifiers such as castor oil or castor oil/tall oil soaps. Thus, it is possible to achieve a saving, based on the weight of fatty acid, of from 5—20% by weight when using an emulsifier of the invention as compared with a known emulsifier as described above. | 50 |
| 10 | Castor Oil 1 part by weight<br>Tall Oil containing 30% rosin acids 1 part by weight<br>Mixed Fatty Acids together with Palm Kernel Oil Fatty Acids 1 part to 2 parts by weight  | In order that the invention may be well understood the following Examples are given by way of illustration only. In the Examples all parts and percentages are by weight unless otherwise stated.  | 55 |
| 15 | The soaps used in the emulsifiers of this invention will be water-soluble soaps such as the alkali metal, especially sodium, or amine soaps of the fatty acid components and may be produced by conventional techniques well known in the art.  | The examples show, in tabular form, the compositions of three types of disinfectant composition formulated with one of five types of soap, namely:—  | 60 |
| 20 | As stated above, the present invention is also concerned with compositions emulsified with the emulsifiers defined above and, particularly, is concerned with emulsified disinfectant compositions emulsified with the emulsifiers as defined above. The invention is particularly concerned with "fortified pine fluids" and "modified fortified pine fluids". These may be generally defined as comprising an emulsion of Pine Oil with or without terpene hydrocarbons (for example terpinolene, or dipentene); a synthetic phenolic germicide and, optionally, perfumery materials in a saponaceous base. A wide variety of germicides may be used in the emulsified disinfectant compositions of the invention such as:— | Soap A a conventional castor oil sodium soap<br>Soap B a conventional 1:1 castor oil/tall oil (Vantal D30; the word "Vantal" is a Registered Trade Mark) sodium soap   | 65 |
| 25 |   | Soap C a sodium soap in accordance with the invention and derived from:—   | 70 |
| 30 |   | Castor Oil 2 parts<br>Tall Oil (Vantal D30) 2 parts<br>Mixed Fatty Acids 3 parts<br>(Distilled Mixed Fatty Acids 176)  | 75 |
| 35 |   | Soap D a sodium soap in accordance with the invention and derived from:—   |    |
| 40 | p - chloro - meta - xylois (P.C.M.X.), orthobenzyl parachloro phenol, monochloro-orthophenyl phenol, p-chloro-meta-cresol (P.C.M.C.) and dichloro-meta-xylo (D.C.M.X.) and P.C.M.C.   | Castor Oil 2 parts<br>Tall Oil (Vantal D30) 2 parts<br>Mixed Fatty Acids 1 part 80<br>(Distilled Fatty Acids 176)  |    |
| 45 | The amount of emulsifier present in the compositions of the invention may be up to 10% by weight (expressed as fatty acids) but is not necessarily so and, indeed, it is one advantage of the invention that, in general,   | Soap E a sodium soap in accordance with the invention and derived from:—   |    |
|    |   | Castor Oil 3 parts 85<br>Tall Oil (Vantal D30) 3 parts<br>Mixed Fatty Acids 2 parts<br>(Distilled mixed fatty acids 176)<br>Palm Kernel Oil Fatty Acids 4 parts 90   |    |

TABLE I

|   | % by weight |      |      |      |      |
|---|-------------|------|------|------|------|
|   | A           | B    | C    | D    | E    |
| Monochloro-orthophenyl phenol             | 1           | 1    | 1    | 1    | 1    |
| Pine Oil and related terpene hydrocarbons | 4.5         | 4.5  | 4.5  | 4.5  | 4.5  |
| Soap A                                    | 5.55        |      |      |      |      |
| Soap B                                    |             | 5.13 |      |      |      |
| Soap C                                    |             |      | 4.70 |      |      |
| Soap D                                    |             |      |      | 4.82 |      |
| Soap E                                    |             |      |      |      | 4.62 |
| Water to,                                 | 100         | 100  | 100  | 100  | 100  |

TABLE II

|   | % by weight    |                |                |                |                |
|---|----------------|----------------|----------------|----------------|----------------|
|   | A <sup>1</sup> | B <sup>1</sup> | C <sup>1</sup> | D <sup>1</sup> | E <sup>1</sup> |
| D.C.M.X.                                  | 2.23           | 2.23           | 2.23           | 2.23           | 2.23           |
| Pine Oil and related terpene hydrocarbons | 3.46           | 3.46           | 3.46           | 3.46           | 3.46           |
| Soap A                                    | 5.70           |                |                |                |                |
| Soap B                                    |                | 5.45           |                |                |                |
| Soap C                                    |                |                | 4.70           |                |                |
| Soap D                                    |                |                |                | 4.80           |                |
| Soap E                                    |                |                |                |                | 4.6            |
| Sodium hydroxide                          | 0.3            | 0.3            | 0.3            | 0.3            | 0.3            |
| Water to,                                 | 100            | 100            | 100            | 100            | 100            |

TABLE III

|                              | % by weight     |                 |                 |                 |                 |
|------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                              | A <sup>11</sup> | B <sup>11</sup> | C <sup>11</sup> | D <sup>11</sup> | E <sup>11</sup> |
| D.C.M.X.                     | 2.1             | 2.1             | 2.1             | 2.1             | 2.1             |
| Industrial Methylated Spirit | 19.7            | 19.7            | 19.7            | 19.7            | 19.7            |
| Terpineol BP                 | 9.0             | 9.0             | 9.0             | 9.0             | 9.0             |
| Soap A                       | 4.8             |                 |                 |                 |                 |
| Soap B                       |                 | 5.1             |                 |                 |                 |
| Soap C                       |                 |                 | 4.7             |                 |                 |
| Soap D                       |                 |                 |                 | 4.8             |                 |
| Soap E                       |                 |                 |                 |                 | 4.6             |
| Soft Water to,               | 100             | 100             | 100             | 100             | 100             |

5 As may be seen, disinfectant compositions may be formulated using the soaps in accordance with the invention in lesser amounts than the prior art conventional soaps.

WHAT WE CLAIM IS:—

1. An emulsifier comprising a mixture of soaps of (a) castor oil; (b) of tall oil; and (c) a mixed fatty acid component comprising a mixture of (i) oleic, linoleic and linolenic acids and (ii) lauric, palmitic and stearic acids.
2. An emulsifier as claimed in Claim 1 in which the mixed fatty acid component (c) comprises a major proportion of component (i) and a minor proportion of component (ii).
3. An emulsifier as claimed in Claim 2 in which component (c) comprises from 60 to 80% by weight of component (i) and from 20 to 40% by weight of component (ii).
4. An emulsifier as claimed in any one of the preceding claims in which component (c) has an acid value of from 190 to 210, an iodine value of from 90 to 125 and a titre of from 21 to 26°C.
5. An emulsifier as claimed in any one of the preceding claims in which the tall oil contains about 30% by weight of rosin acids.
6. An emulsifier as claimed in any one of the preceding claims in which the weight ratio of component (a) to component (b) is within the range 75:25—25:75.
7. An emulsifier as claimed in Claim 6 in which the said weight ratio is within the range of 60:40—40:60.
8. An emulsifier as claimed in Claim 7 in which the said weight ratio is about 50:50.
9. An emulsifier as claimed in any one of the preceding claims in which component (c)

is present in an amount of up to 100% of the 40 combined weight components (a) and (b).

10. An emulsifier as claimed in Claim 9 in which component (c) is present in an amount of from 20 to 80% of the combined weight of the components (a) and (b).

11. An emulsifier as claimed in Claim 10 which is a soap of the following mixture:—

|  |                         |
|--|-------------------------|
| Castor Oil                             | 2 parts by weight       |
| Tall Oil containing<br>30% rosin acids | 2 parts by weight       |
| Mixed Fatty Acids                      | 1 to 3 parts by weight. |

12. An emulsifier as claimed in any one of the preceding claims also containing soaps of (d) palm kernel oil fatty acids.

13. An emulsifier as claimed in Claim 12 in which the palm kernel oil fatty acids component (d) is a distilled material.

14. An emulsifier as claimed in Claim 12 or Claim 13 in which the palm kernel oil fatty acids component (d) has an acid value of from 250—266, an iodine value 14—20 and a titre of 23—27°C.

15. An emulsifier as claimed in one of Claims 12—14 in which component (d) is present in an amount of up to 75% by weight 65 of the combined weight of components (c) and (d).

16. A soap as claimed in any one of Claims 12—15 which comprises the mixed soaps of:—

|  |                         |    |
|--|-------------------------|----|
| Castor Oil   | 1 part by weight        | 70 |
| Tall Oil containing<br>30% rosin acids                               | 1 part by weight        |    |
| Mixed Fatty Acids<br>together with Palm<br>Kernel Oil Fatty<br>Acids |                         | 75 |
|  | 1 to 2 parts by weight. |    |

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17. An emulsifier as claimed in any one of the preceding claims comprising a mixture of sodium soaps of the specified acids.

18. An emulsifier as claimed in Claim 1 substantially as hereinbefore described and with reference to the Examples.

19. A composition emulsified with an emulsifier as claimed in any one of the preceding claims.

10 20. A composition as claimed in Claim 19 which is a disinfectant composition.

21. A composition as claimed in Claim 20 in the form of a fortified pine fluid or modified fortified pine fluid.

22. A composition as claimed in any one of Claims 19—21 containing up to 10% by weight of emulsifier (expressed as fatty acids).

23. A composition as claimed in Claim 19 substantially as hereinbefore described and with reference to the accompanying Examples.

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